ANDREWS, TEXAS

Exemption Request for Special Nuclear Materials
U.S. Nuclear Regulatory Commission
Rockville, Maryland
February 24, 2014

Overview

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- Site Operations & Candidate Waste Streams
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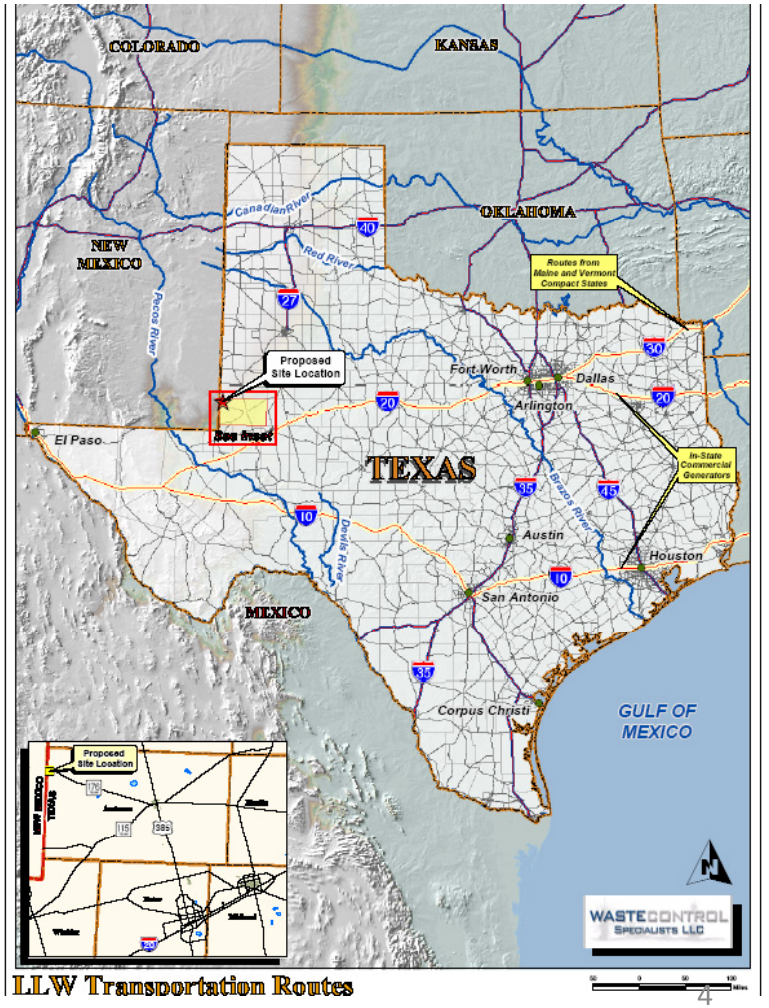
Licensing Overview

J. Scott Kirk, CHP
Vice President Of Licensing & Corporate Compliance

First Operating Facility in Over 40 Years

- WCS is the first operating facility licensed to dispose of Class A, B and C LLW under the LLWPA of 1980 (as amended in 1985).
  - Disposal authorized in the Texas Compact Waste Disposal and Federal Waste Disposal Facilities
    - 3,890,000 Ci for CWF
    - 5,600,000 Ci for FWF
- Licensed by Texas Commission on Environmental Quality (TCEQ) and located in Andrews County, Texas.



Licensing Overview

- WCS has concentration-based limits for SNM as previously approved by the NRC for waste receipts at the Treatment, Storage and Disposal Facility (TSDF).
- WCS also has above ground, mass-based limits for SNM approved for receipt at the Federal Waste Disposal Facility and Texas Compact Waste Disposal Facility.
- Determination of which limits apply are based on which facility will receive the waste for treatment/storage at the TSDF or for disposal at either the CWF or FWF.

Licensing Overview (Cont.)

- The TCEQ recently amended RML R04100 to include a definition of “In-Transport”.
  - Minor amendment that was noticed for public comment in the Texas Register.
  - The definition was based on a previous precedent for Envirocare of Utah (EOU).
  - TCEQ and NRC discussed the approach before the amendment was approved.

License Condition 11.T
Definition of “In-Transport”

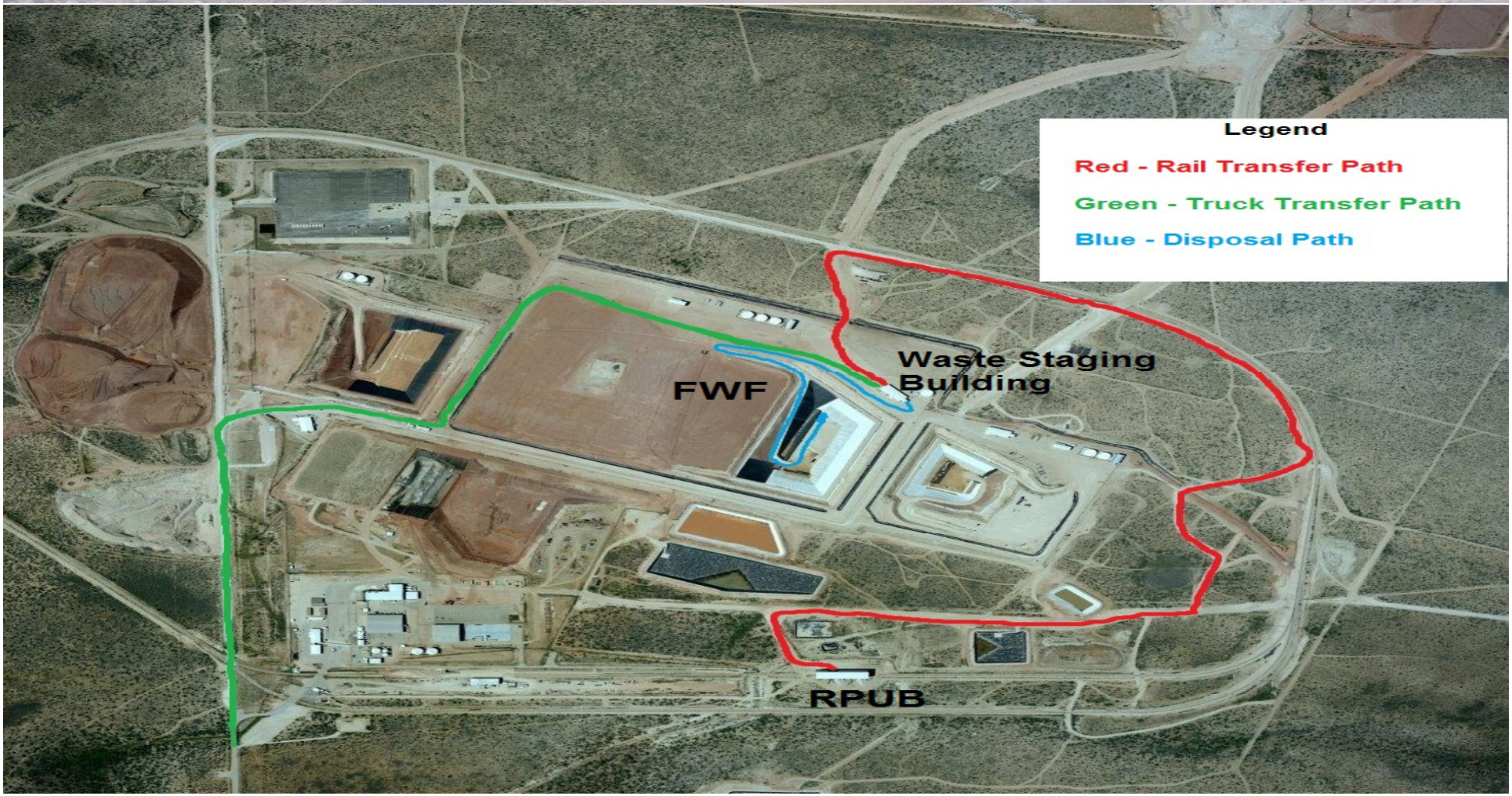
Expanding the Safety Concept for Transportation to On-site Transfers

- DOT/NRC regulations and LC-11.T allow transport of SNM exceeding the 10 CFR 150 limits over thousands of miles.
  - DOT/NRC regulatory requirements were established to prevent an criticality accidents during the transport of SNM.
  - Transport of SNM is performed by carriers who are exempted from having an NRC possession license.
- A better regulatory framework is needed to allow on-site transfers of SNM:
  - Where transfers would be made by experienced personnel, within an controlled facility that is licensed by an agreement state.
  - That would allow transfers to be performed in a more efficient manner and still ensure nuclear criticality safety.

Site Operations & Candidate Waste Streams

Jay Britten
Vice President of Operations

WCS Site Operations Aerial Overview



WCS Site Operations

Receipt of Waste by Rail:

- Rail shipments are received at the Rail Pedestal Unloading Building (RPUB).
- All waste acceptance activities are conducted within the building prior to and during the offloading process.
- Containers are transloaded onto a WCS transfer vehicle
- Any loading activity will be consistent with pre-determined criticality safety evaluations for packages and package arrays.
- Upon waste acceptance, the WCS transfer vehicle will utilize the east to north route into Federal Waste Facility.

WCS Site Operations

Receipt of Waste by Road:

- Over the road shipments are received at the LLRW Administrative Building.
- Upon waste acceptance, the WCS transfer vehicle will utilize the dedicated western entry into Federal Waste Facility.
- Container transloading occurs within the Waste Staging Building onto a WCS transfer vehicle in a configuration consistent with the nuclear criticality safety requirements associated with the package and package arrays.

Example Waste Stream

- Inventory consists of 6M (55 gal & 110 gal) and 17C (55 gal) type drums.
- Approximately 167 drums total in the inventory in which 161 drums are LLRW and 6 drums are MLLRW.
- 111 of the LLRW drums are < 200g SNM & 50 drums are > 200g SNM and consist of Class A – C waste classifications.
- All six of the MLLRW containers are <200g SNM and are considered Class A waste. Associated waste codes are F1 and F2.
- 6M drum configuration is being evaluated for the 10-160B cask certificate modification to increase the FGE loading up to 4,000 FGE.

Example Waste Package

Individual Containers shipped in a 10-160B Cask

10-160B Cask

WCS Safety Culture

Repetitive Work Activities:

- WCS has successfully performed over 200 remote handled shipments to date without incident.
- Operational philosophy is for workers to have a “questioning attitude” or “chronic unease” especially for first time evolutions.
- Repetitive work activities tend to trend in the overconfidence or complacency phases of the workers.
- As such, WCS consistently strives to keep workers in the “chronic unease” category to prevent careless mistakes.
- The other two categories put workers at risk in that operators may take things for granted and/or make assumptions about prerequisite activities.
- This can cause personnel injury rates or incident rates to unnecessarily rise (also to include near misses).

Risk Reduction

- It is the WCS goal to ensure that, as a state-of –the-art commercial facility, the industry standard for safety is established within the company.
  - Safely grouping containers, consistent with criticality safety evaluations, for transfer to the cell would significantly reduce the probability for error.
  - Each time a container is handled, the probability of incidents increases as well as radiation doses .
  - Overall total “in transit” time and distance required to move the containers are greatly reduced.
  - Exemption request supports mission to maintain radiation doses ALARA.

Public Interest

- This exemption request supports the DOE's mission to cleanup of legacy sites in a safe and cost effective waste manner.
- It provides for a safe, compliant disposal solution for problematic waste streams that are currently in storage awaiting a disposal pathway.
- Approval of the exemption request is needed to reduce the radiological and non-radiological risks involving transfer and movement of SNM.

Regulatory Precedents and Exemption Threshold

Bob Pierson

History of Regulatory Issue

- June 1997 –NRC inspectors learn from the State of Utah that more than 2,400 grams of uranium-235 had been held in temporary storage at the EOU facility near Clive, Utah.
- Conditions of the State of Utah license under which the facility operates a facility to dispose of mildly radioactive waste material allow only 350 grams uranium- 235 special nuclear material to be held at the site without being placed in a permanent disposal cell.
- NRC issues a Confirmatory Order to EOU and directs company to stop receiving shipments of waste material containing the special nuclear material uranium-235.
- EOU must submit an acceptable compliance plan for handling waste that limits the quantity of special nuclear material held on site outside of a permanent disposal cell to less than 350 grams.

NRC Inspection of EOU

- October 1997 - NRC conducted an inspection of EOU and determined that they apparently violated NRC regulations by possessing special nuclear material in quantities in excess of Federal limits between May and September 1997.
- April 1998 – In a letter transmitting the inspection report findings to EOU, the NRC directs that EOU provide information providing the reasons for the apparent violation, corrective steps that have been taken and the results achieved, measures taken to avoid further violations and the date when full compliance with NRC requirements will be achieved.

NRC Staff Explores Ways to Allow EOU to Process Waste Shipments

- NRC concerned that Compliance Plan had not resulted in improving safety of waste transfers at the facility
- NRC Staff explored ways in which waste material could be shipped directly to the disposal site without exceeding SNM limits
- NRC Staff considered that if the SNM waste was shipped in accordance with 10 CFR Part 71 and applicable DOT regulations that these conditions were sufficiently protective while the waste was on the rail car regardless of whether the rail car was inside or outside the site boundary.
- NRC approves the exemption request and issues a EA/FONSI.

Current Restrictions

- WCS is currently restricted to transferring single containers to the disposal unit for offloading into Modular Concrete Canisters (MCCs).
  - Requires double handling of containers and is not operationally efficient.
- WCS needs the ability to rely on NRC criticality safety requirements for transportation to receive, transfer to the disposal unit, and offload waste exceeding the above ground SNM possession limits into a MCC.

Exemption Under 10 CFR 70.17

- WCS requires approval of an exemption request under 10 CFR 70.17*, Specific Exemptions*.
- Approval requires a finding that the basis for the exemption:
  - Are authorized by law
  - Will not endanger life or property or the common defense and security
  - Are otherwise in the public interest

Authorized by Law

- The proposed exemption request is consistent with the precedents established in a previous exemption request granted by the Commission and the State of Utah.
- Under Section 274f of the Atomic Energy Act the Commission is authorized, by regulation or order, to grant exemptions from licensing requirements, and from its regulations applicable to licensees, as the Commission finds necessary or appropriate, to carry out an agreement with an Agreement State.

Will Not Endanger Life or Property

- The exemption will not endanger life or property as it is based on rigorous criticality safety regulations imposed by the Commission under 10 CFR Part 71.
- The criticality safety requirements in 10 CFR Part 71 protect public health and the environment during normal transport and severe transportation accident conditions.
- Criticality safety evaluations conducted under 10 CFR Part 71 consider SNM as packaged for and presented for transport.

Will Not Endanger the Common Defense or Security

- Utilizing commercial sites like WCS could allow DOE to provide more timely safe disposal of legacy SNM wastes with additional certainty thus limiting potential public exposure or risk or potential diversion of SNM at decommissioning sites thus enhancing common defense or security.
- More quickly and efficiently disposing of SNM at WCS will reduce the public risk of exposure to SNM or the potential for diversion of SNM, thus enhancing the common defense and security.

Are Otherwise in the Public Interest

- WCS believes that the proposed exemption is in the public interest for the following reasons:
  - Allows WCS to conduct transfer operations in a safer, more secure and more efficient manner by reducing the number of onsite transfers of SNM.
  - Utilizing commercial sites like WCS could allow DOE to dispose of legacy SNM wastes with reduced costs and more timely schedules.
  - Additional disposal destinations for DOE waste could reduce the need for storage of these wastes at DOE sites reducing potential public exposure and risk.

Conclusions

- Issuance of the proposed exemption is authorized by law and is consistent with previously established precedent.
- Issuance of the proposed exemption will contribute to the public interest and safety and will provide potential significant cost savings to the industry and the Department of Energy by providing additional disposal options for legacy SNM.

Regulatory and Technical Basis for the Exemption Request

Earl Easton

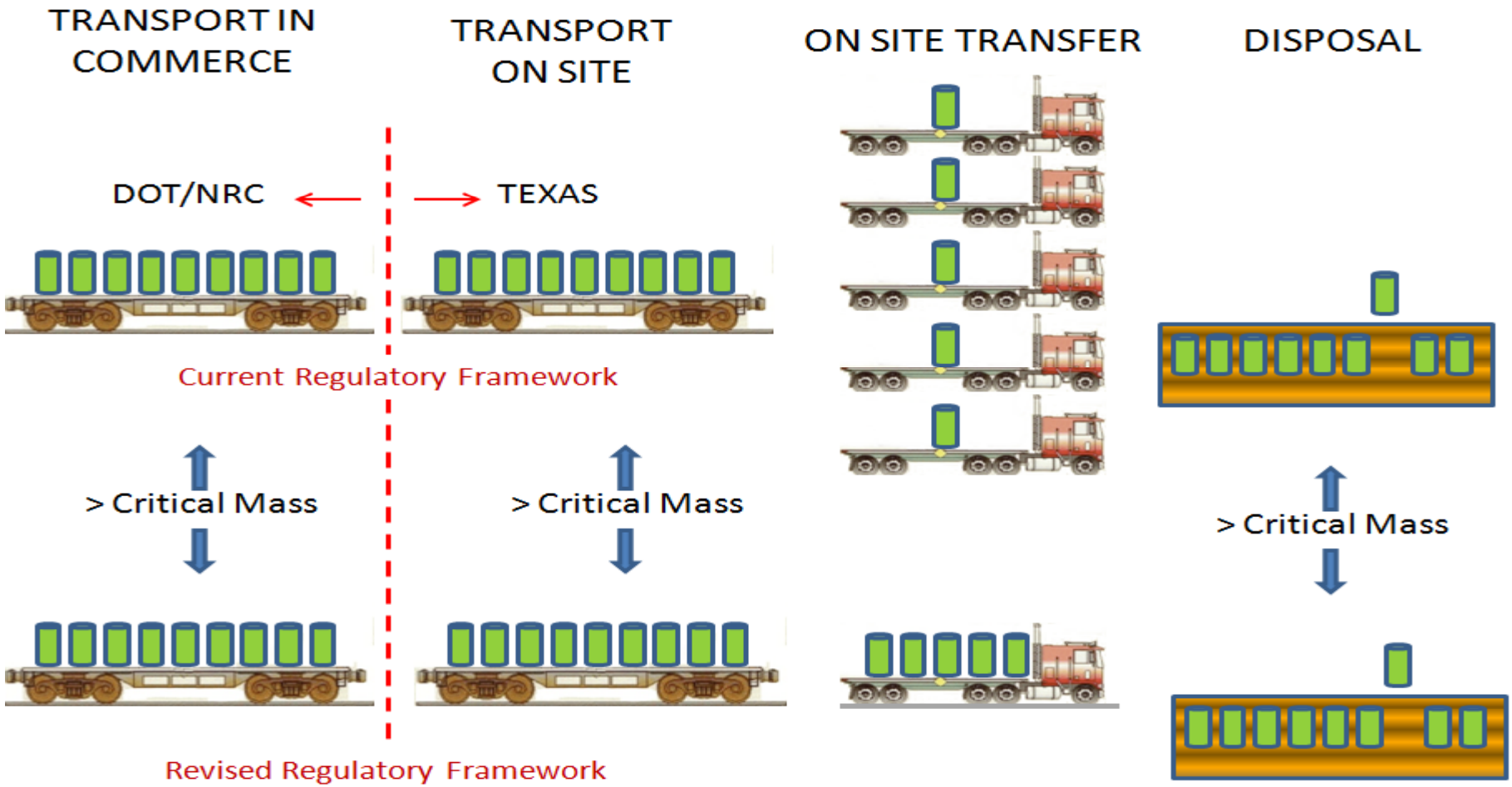
Exemption Request

- Would allow WCS to possess under specified conditions waste containing SNM in quantities exceeding 10 CFR 150.11 without having to obtain an NRC license.
- Conditions based on maintaining above ground SNM waste in packages approved under criticality safety requirements for transportation until emplaced for disposal.

Need for Exemption

- Reduces number of shipments and handling of waste.
- Reduces burden and expense on commercial and DOE waste generators.
- Provides DOE a viable option to dispose of legacy wastes.
- Provides a logical transition from Federal regulation for transportation to State regulation for disposal.

Technical Basis

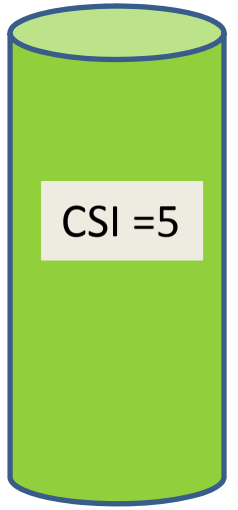


Criticality Safety for an Individual Package 10 CFR 71.55

$K_{eff} < 0.95$

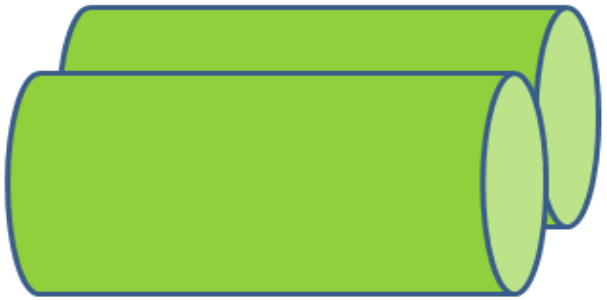
A single package must remain sub-critical for both Normal and Hypothetical Accident Conditions

Each package will be assigned a Criticality Safety Index (CSI) in accordance with 10 CFR Part 71. The CSI is used to limit the number of packages shipped on a conveyance.



Criticality Safety Index
10 CFR 71.59

Based on five times the number of packages shipped remaining sub-critical during normal transport conditions.



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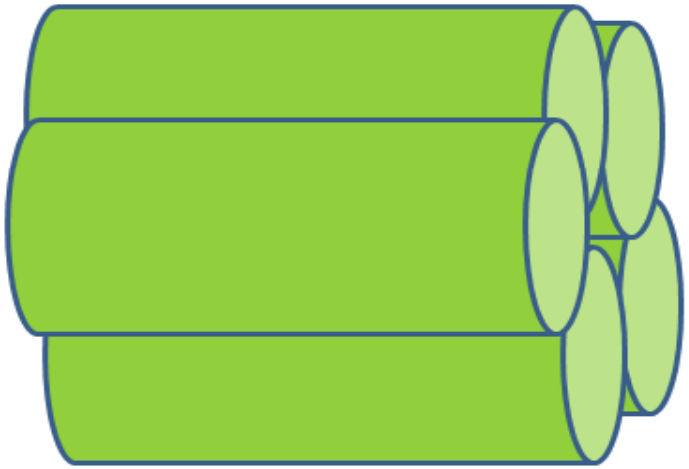


Based on two times the number of packages shipped remaining sub-critical under hypothetical accident conditions

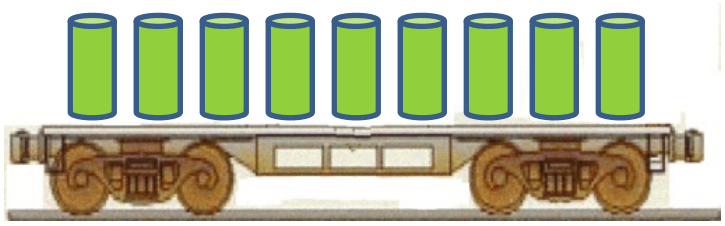
Criticality Safety Index
10 CFR 71.22

The CSI for packages shipped under a General License is determined from following formula:

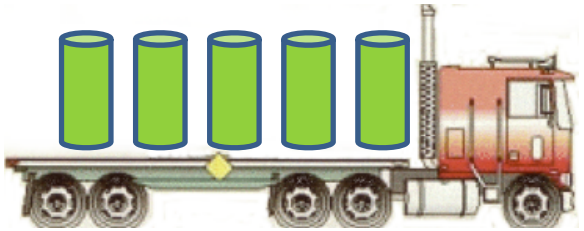
$$CSI = 10 \left[\frac{\text{grams of } {}^{235}U}{X} + \frac{\text{grams of } {}^{233}U}{Y} + \frac{\text{grams of Pu}}{Z} \right]$$

Criticality Safety for Conveyance

The number of packages on a conveyance will be controlled by limiting the sum of Criticality Safety Indices to 50.



For example, if the CSI for a package is 2, then 25 packages can be shipped on a single conveyance. This means that an array 50 undamaged packages must be shown to sub-critical under normal transport conditions, and 125 damaged packages must be shown to be sub-critical under hypothetical transport accident conditions.



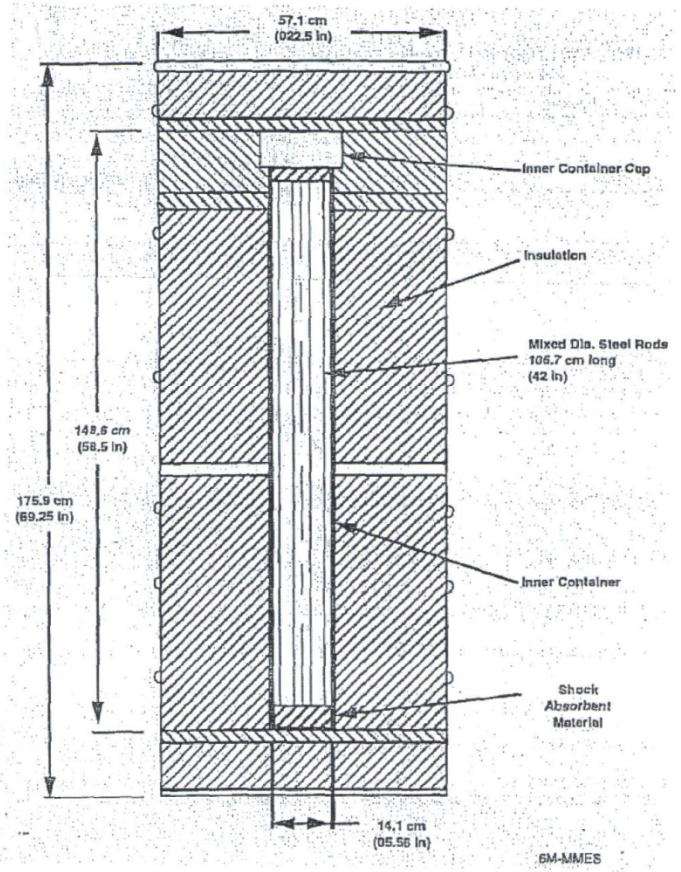
Example of How the Exemption would be Implemented

SNM wastes will be shipped to WCS in an NRC certified package - CNS 10-160B

Individual waste containers would be unloaded from CNS 10-160B and loaded on a transfer vehicle provided that:

Example of How the Exemption would be Implemented

- The container design has been analyzed under 10 CFR 71.55.
- The container design has been assigned a CSI in accordance with 10 CFR Part 71.
- The sum of the CSI's for all containers on a conveyance does not exceed 50.
- The containers are securely fastened to or within the conveyance.

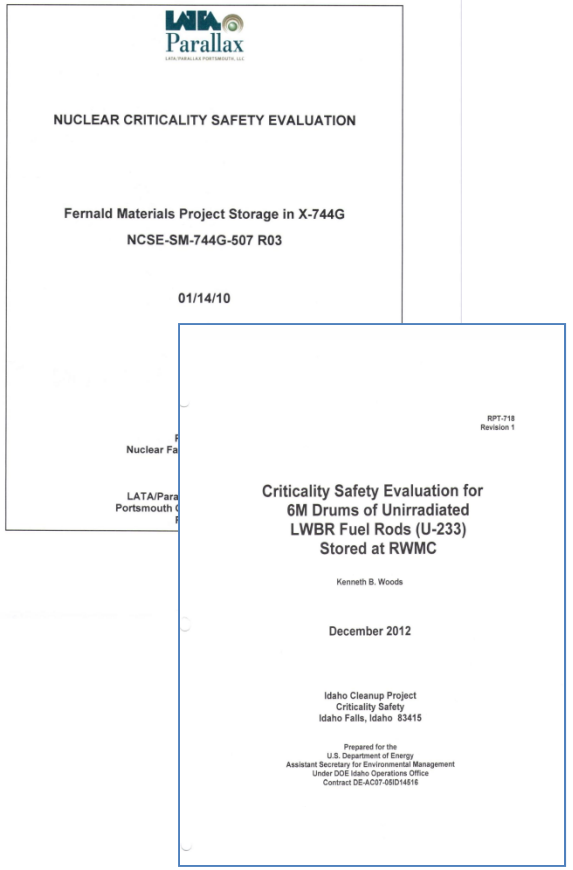


Example of How the Exemption would be Implemented

For DOE wastes, the criticality safety evaluation for the container and the assignment of a CSI would be based on the safety analyses performed at DOE sites for on-site storage and transfer.

NRC package certification would not be requested for transfer packages as the packages would not be used in public transportation.

The on-site transfer would not be subject to DOT regulations as the packages would not be used in public transportation



Controls to be Exercised During On Site Transfer

WCS will implement a number of additional controls to enhance safety during on-site transfer:

- SMN wastes will remain in packages meeting NRC criticality safety standards during on-site transfer.
- The number of packages on a transfer conveyance will be limited by Criticality Safety Indices determined in accordance with NRC regulations.

Controls to be Exercised During On Site Transfer (Cont.)

- Transfers will only occur on dedicated roads.
- The speed of transfer vehicles will be limited to 25 miles per hour.
- All on-site transfers will be escorted.
- Access to transfer routes will be blocked during transfer.
- Only one transfer package will be opened at any one time.
- Waste must be placed in a safe disposal configuration within 24 hours of transfer.

Meeting Outcome

Exemption Conclusions

- WCS believes that the exemption request meets the exemption approval criteria in 10 CFR 70.17.
- WCS believes that SNM waste can be safely and more efficiently transferred on-site using NRC criticality safety requirements for transportation.
- Approval of the exemption will reduce the risk and lower radiation doses attributable to handling large numbers of packages containing SNM

Next Steps

- WCS to formally submit the exemption request in the next few weeks.
- WCS needs an exemption no later than early this summer.
- Coordination with TCEQ will be needed amend RML R04100.

Discussion